

What is claimed is:

1. A foamable igniter composition effective to form a foamed igniter substance, the foamable igniter composition comprising:

a fluoropolymer binder oxidant;

a plasticizer effective to render the fluoropolymer binder oxidant flexible;

a metal fuel which is reactive with the fluoropolymer binder oxidant;

a blowing agent effective to render the foamable igniter composition porous; and

a crosslinking agent effective to structurally stabilize the foamed igniter substance;

wherein, upon being heated to a predetermined temperature, the foamable igniter composition forms the foamed igniter substance.

2. The foamable igniter composition of claim 1, wherein, upon being heated to a predetermined temperature, the foamable igniter composition forms a resilient foamed igniter substance.

3. The foamable igniter composition of claim 1, wherein the fluoropolymer binder material oxidant additionally imparts adhesive properties to the foamable igniter material effective to adhere the foamed igniter substance to an associated surface.

4. The foamable igniter composition of claim 1, wherein the fluoropolymer binder material oxidant comprises a fluoropolymer elastomer material.

5. The foamable igniter composition of claim 1, wherein the fluoropolymer binder material oxidant is selected from the group consisting of dipolymers of vinylidene fluoride and hexafluoropropene, terpolymers of vinylidene fluoride, hexafluoropropene and tetrafluoroethene, and combinations thereof.

6. The foamable igniter composition of claim 1, wherein the plasticizer comprises a fluorocarbon oil.

7. The foamable igniter composition of claim 1, wherein the metal fuel is selected from the group consisting of aluminum, magnesium, alloys of aluminum and magnesium, and combinations thereof.

8. The foamable igniter composition of claim 1, wherein, upon being heated to a predetermined temperature, the blowing agent at least partially thermally decomposes to render the foamable igniter composition porous.

9. The foamable igniter composition of claim 1, wherein the blowing agent is selected from group consisting of aminoguanidine bicarbonate, ammonium oxalate, p-toluene sulfonyl semicarbazide, 4,4' oxydibenzene hydrazide, acetone, ethyl acetate, butyl acetate, amyl acetate and combinations thereof.

10. The foamable igniter composition of claim 1, wherein, upon being heated to a predetermined temperature, the crosslinking agent chemically reacts with the fluoropolymer binder oxidant to structurally stabilize the foamed igniter substance.

11. The foamable igniter composition of claim 1, wherein the crosslinking agent comprises at least one bi-functional crosslinking agent and at least one peroxide crosslinking agent.

12. A hybrid gas storage container for use in an automotive safety restraint system comprising:

the foamable igniter composition of claim 1 applied to an inner surface of the hybrid gas storage container;

wherein, upon being heated to a predetermined temperature, the foamable igniter composition forms a foamed igniter substance that adheres to the inner surface of the hybrid gas storage container.

13. A foamed igniter substance having a predetermined shape comprising:

the foamable igniter composition of claim 1;

wherein the foamable igniter composition has a consistency effective to render the composition extrudable and, wherein, upon being heated to a predetermined temperature, the foamable igniter composition forms a foamed igniter substance having a predetermined shape.

14. A damper pad cushion for use in an automotive airbag inflator comprising:

the foamable igniter composition of claim 1;

wherein the foamable igniter composition, upon being heated to a predetermined temperature at a select pressure in a mold having a desired shape, forms a foamed damper pad cushion.

15. An igniter stick for use in an automotive airbag inflator comprising:

the foamable igniter composition of claim 1;

wherein the foamable igniter composition, upon being heated to a predetermined temperature, forms a foamed igniter stick.

16. A method of making a foamed igniter substance, the method comprising:

heating the foamable igniter composition of claim 1 to a temperature effective to at least partially decompose the blowing agent and foam the igniter composition; and

crosslinking the foamed igniter composition to form a foamed igniter substance.

17. The method of claim 16, wherein during the heating the foamable igniter composition is heated to a temperature between about 160° and about 200°C.

18. The method of claim 16 further comprising applying the foamable igniter composition onto a surface to be coated by the foamed igniter substance prior to the heating.

19. The method of claim 16 further comprising extruding the foamable igniter composition into a predetermined shape prior to the heating.

20. The method of claim 16 further comprising loading the foamable igniter composition into a mold and applying pressure during the heating.

21. A foamable igniter composition effective to form a foamed igniter substance, the foamable igniter composition comprising:

about 10 to about 60 composition weight percent of a fluoropolymer binder oxidant;

about 1 to about 40 composition weight percent of a plasticizer effective to render the fluoropolymer binder material oxidant flexible;

about 10 to about 50 composition weight percent of a metal fuel that is reactive with the fluoropolymer binder oxidant;

about 0.1 to about 30 composition weight percent of a blowing agent effective to render the foamable igniter composition porous; and

about 0.5 to about 5 composition weight percent of a crosslinking agent effective to structurally stabilize the foamed igniter substance;

wherein, upon being heated to a predetermined temperature, the foamable igniter composition forms the foamed igniter substance.

22. The foamable igniter composition of claim 21, wherein the fluoropolymer binder oxidant is a dipolymer of vinylidene fluoride and hexafluoropropene.

23. The foamable igniter composition of claim 21, wherein the plasticizer is polytrifluorochloroethylene.

24. The foamable igniter composition of claim 21, wherein the metal fuel is magnesium metal.

25. The foamable igniter composition of claim 21, wherein the blowing agent comprises p-toluene sulfonyl semicarbazide.

26. The foamable igniter composition of claim 21, wherein the crosslinking agent comprises at least one bi-functional crosslinking agent and at least one peroxide crosslinking agent.

27. The foamable igniter composition of claim 26, wherein the bi-functional crosslinking agent is trimethylolpropane trimethacrylate.

28. The foamable igniter composition of claim 26, wherein the peroxide crosslinking agent is benzoyl peroxide.